

A Study of Transnational Internet d-Learning for Primary and Middle School – Aviation Technology Education

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ABSTRACT: In recent years, Taiwan government put it this way -- if there is not improvement to national competitive advantage, then, there is no advantage. There is a need to expand the performance of studying in order to build national power and improve the well-being of our people. Several initiatives have been adopted to enhance the scientific and technological strength of the country. This year, national authority focused on “innovative science, technology research and development”, a new lease of life was given to encourage the economy growth. At the 7th national scientific and technical meeting, leaders drafted 6 tactics designed to guide the first stage of the national scientific and technical development plan (the 94-97th year of R.O.C.).

Aviation technology education was the focus of the transnational d-learning course. It was designed for students to study and do research between countries over the Internet. Part of the research was to develop a clearinghouse for existing and newly developed aviation education materials, strategies, methods, etc. If our country follows this model, it should become a leader for the input and application of new scientific and technological knowledge used to: educate and train future manpower, improve scientific knowledge, create technological innovations, and digitize scientific and technological education materials in an organized fashion to benefit a Hi-Tech country.

Keywords: Aviation technology, Transnational Internet d-Learning

1 Introduction

The scope of human activities has moved from the land to the ocean, from the ocean to the atmosphere, and a gradual expansion to outer space. The era that appeared in the 1950 was very technological as it opened the new era in which human started the exploration of outer space. Due to rapid development in the last five decades, aviation activities have provided leadership that has promoted the development of productivity,

progress, and influence on society. The science and technology of aviation has already become one of the most influential high technologies of modern society.

The development and use of the important content of aviation science and technology has modernized countries all over the world. Aviation Technology Education and Portfolio Assessment were two key issues. How to deal

with the Research Information Skills (RIS) to mold content and structure of one subject in order to benefit both the education of science and technology of aviation and how to deal with the materials required to digitize the course file. [9]

Initiation of the research on portfolio assessment for RIS used the following definition of portfolios: A portfolio provides a complex and comprehensive view of student performance in context. It is a portfolio when the student is a participant in, rather than the object of assessment . . . it provides a forum that encourages students to develop the abilities needed to become independent, self-directed learners[24].

The study of portfolio assessment was further guided by Wolf's definition that it is the process that knowledgeable teachers engage in when they systematically observe and selectively document their students' performance through multiple methods, across diverse contexts, and over time as students participate in meaningful learning activities[12].

The advantages of portfolio assessment [20] [21] [2], were noted when initially deciding on portfolio assessment. Certain expectations were raised about the use of portfolio assessment in the module on RIS. These expectations concerned benefits for the learner, benefits for the lecturer, and benefits for course developer are dealt with more details. Notes the disadvantages listed in the subject literature and in possible weakness. It may avoid or compensated. Several authors [12] [7] [4] [20] discussed students' reactions related to portfolios. The following statement indicates some of the disadvantages and what type of compensation was attempted.

Recently teachers have been trying Project-based learning (PBL) which is different from the traditional teaching method. PBL emphasizes in helping students apply what they have learned to daily life innovatively. PBL is a constructivist approach which provides learners a complex and authentic Aviation Project. The students find subject matter, design questions, draw up action plans, collect information, solve problems, set up policies, complete a research process, and present a learning mode for the Aviation Project. [5] [17] [8] This learning mode integrates the learning from life experiences and inter-disciplinary courses.

Therefore, a portfolio can be used as a record of the details of a student's course on the network. It may be shared, experienced, applied, within PBL learning; and even through a transnational

cooperation. As one goes through file assessment, teachers and students can make effective assessment of ability, through junior high school and primary schools science and technology study platform, and the constructive use by navigate the concepts of science and technology education.

2 Literature analysis

The administrative policy of the Ministry of Education always focuses on actively promoting, producing, and studying collaboration; international cooperation and exchange; and coaching the school characteristic of set up to improve educational quality [16]. In the key areas of science and technology education, the Ministry of Education promotes the relevant improvement of plans and researches these are correlated with student and faculty exchange programs and arranges the focal point over the years. Currently the focus on science and technology is combined with transnational cooperation and networking. The plan is to study ways to strengthen teaching methods for the ability to research as guided by the teacher and to use the science and technology of aviation as a means to train students in the concepts, theory, and practice of science and technology of aviation. This is a planned case study and it demonstrates how to carry out training.

2.1 The Importance of Aviation Technology Education to basic education

The National Science Council takes a broader view of the whole world [19]. Knowledge and information seem to grow at a continuously faster speed. The benefit of international economic trade tends to liberalize society therefore changing educational policy. In addition, ecology and environmental protection requirements are rigorously enforced. As populations increase other serious problems are considered grain, energy, source of water, the earth's long-term ecological balance, and the demands of human development, all become the challenge of national development. The most important thing is the impact in an era of a knowledge-driven economy.

The information-intensive society comes with higher speed and affects the operation of human life. Enterprises and policy for education will be influenced deeply throughout the world because of the progress in science and technology. This

progress has shrinking communication distance among people and expanding information exchange between countries.

The earth has already become a global village with great promise for the future. Therefore, it makes no difference if it's in communications or transportation, air transportation, space science and technology of aviation, shipping, land or water transportation; all face digitized arrival times, selection of suitable materials, and challenges as talents fostered.

These must emerge into general education as the core course for new era. To meet the aforementioned challenges, the key positions for knowledge and cultural exchanges enacted for aviation science and technology must form the important foundation to educate skilled personnel. It is important to cultivate the concepts of aviation science and technology for the middle and primary schools. Students must attain knowledge and skills, in other words, the implementation of the education of aviation science and technology is an important subject that can't be ignored in basic education [16] [8] .

2.2 Transnational Internet d-Learning for Primary and Middle School with Aviation Technology Education

Recently, the portfolio model has been adopted by many disciplines, especially in higher education circles. According to Cambridge [1] "portfolios have features that make them powerful tools of learning and assessment". Portfolios are also used to assess one's performance as an employee. This is particularly true in education, where many educators maintain teaching portfolios. In nursing, professional portfolios are used in the clinical arena as a means to collect visible documentation of contributions to practice for the purpose of credentialing [14]. For example, in the United States, applicants for advanced practice credentialing in genetics must submit a professional portfolio [11]. Professional portfolios are also used as a means to assess continued professional development. Driscoll reported that they are used to assess orthopedic nursing practice in the United Kingdom [6] [16] [21].

A web folio is defined as a "tightly integrated collection of web-based multimedia documents that include curriculum standards, course assignments and corresponding student artifacts in response to the assignments and reviewer

feedback to the student's work [10] ." Ittelson described a universal academic electronic identity (e-identity) clearinghouse to maintain a composite of a student's performance. He used the analogy of a credit bureau to explain how e-identity extends beyond the traditional transcript in providing valuable information about students and their performance [13]. With the movement toward competency-based curricula, an increasing number of higher education institutions require electronic portfolios for students.

These tools offer other benefits. They foster creative thinking and collaboration. They allow easier integration of content across courses and they affect faculty and students roles [10] [26]. Students are no longer mere recipients of information; rather, they construct meaning from information and transform it to knowledge. Faculty members, no longer mere disseminators of information, are guiders who facilitate student learning. E-portfolios promote the concept of lifelong learning and allow for both formative and summative self-evaluations [15] [27].

Another opinion stated that the flexibility and authentic nature of electronic portfolios will prove to be important in reducing teachers' paper shuffling [18] [23] [22] [25].

Information can be self-reported as text, uploaded files, and web links. Entered work can be associated with one or more professional standards. Text fields and prompts encourage reflection. Portfolios are available for life. Sharing Information Portfolios include options for user feedback relating to shared materials. The e-portfolio owner can track viewing privileges and the extent to which the information has been.

2.3 Analysis on Web-Enhanced Project-Based Learning in Connection with the Portfolio To Aviation Technology Education

Bean pointed that interdisciplinary courses have four features. First, inter-disciplinary courses are based on important issues in real life and thus it is similar to the nature of Aviation Project-based learning in connection with the portfolio. Second, inter-disciplinary courses apply knowledge of context rather than limited to knowledge of subject matter. It conforms to the feature of Aviation Project-based learning that it is inter-disciplinary and designed to explore a question which combines contexts in real world. Third, inter-disciplinary courses do research on

current issues, not on a subject. Aviation Project-based learning also does research on current social or scientific issues and aims at fostering a student's ability in exploration and research. It is not limited to the aim of the courses, either. Fourth, inter-disciplinary courses emphasize applying knowledge and solving problems which are also one of the key features of Aviation Project-based learning in connection with the portfolio [4].

2.3.1 Discussing Project-Based Aviation Learning with Constructivism

Constructivists consider that knowledge is understood by a learner's construction. Students should express the learning results by applying surface features of diversified knowledge. Knowledge and techniques already possessed by a learner may influence learning something new[15].

Learning cooperatively and learning to interact with communities will help in-depth learning. PBL also emphasizes a learner's construction of knowledge, and thus adopts a learner-centered model. The instructor will not tell the answer but instruct students in exploring questions and trying to solve problems [29]. The learner constructs his/her knowledge by himself/herself in the process of exploring. Products of PBL can be presented with oral presentation, website, and briefing, etc.

2.3.2 PBL and the Internet

Added to the elements of science and technology, PBL is different from traditional teaching methods either in the development of course content, or the means of delivery. Teachers can apply Internet technology to create different learning opportunities, obtain learning resources, manage teaching resources, and evaluate students' learning results. Information Technology-Assisted PBL can help students develop diversified skills, enhance research skills, and master diversified evaluation methods, such as self-evaluation, peer evaluation, and learning process files, etc[30]. Furthermore, it can promote common consensus in a community through online discussion boards and interaction between peers, instructors, and experts[32]

2.3.3 The Internet Provides Learning Communities (Channels for Collecting Distributed Knowledge)

Learning communities are formed by learners based on different social relationship, such as schools, clubs, organizations, and neighbors, to provide learners a learning opportunity[30]. In this learning environment, the emergence of knowledge relies on the interaction in the community to integrate professional knowledge possessed by different members. Therefore, Brown indicated it as 'distributed cognition' in a learning community [31] [33]. Learners can share their views on how to solve the problems and reach an agreement to examine and solve the problems collaboratively. The Internet plays an important role as the medium for communication in integrating distributed cognition.

2.3.4 Integrative Learning, E-portfolios, and the Transfer Student

The participation of Portland State University (PSU) in a three-year Integrated Learning Project (ILP)—cosponsored by the Carnegie Foundation for the Advancement of Teaching and the Association of American Colleges and Universities—has involved developing and assessing advanced strategies to help students pursue learning in more intentional, connected ways. The underlying assumption of the ILP is that fostering students' abilities to integrate their learning will give them the habits of mind needed to make informed personal, professional, and civic decisions throughout their lives. Much time and attention has been devoted to this project

Purposes of the Aviation Project in portfolio assessment.

This Aviation Project aims at providing opportunities for students participating in international activities under their teachers' supervision. The purposes of it are as follows:

- 1 To cultivate juveniles' abilities in Aviation Projects, and promoting their competitiveness.
- 2 To broaden juveniles' views, develop their scientific and humanistic abilities.
- 3 To encourage juveniles' interests in international cultures and affairs.
- 4 To enrich international teaching activities, and develop friendships.
- 5 To enhance students' ability to communicate and their global vision.
- 6 To advance students' communication ability in Technology Education.

This Aviation Project combines digital information and the Internet to instruct students using PBL to search for information to advance online teaching and learning.

Schedule of the Aviation Project in portfolio assessment

This Aviation Project is scheduled for three phases:

- 1 Starting the Aviation Project in portfolio assessment
- 2 Advance international exchange. (Both interactive and non-interactive activities.)
- 3 Creation Period

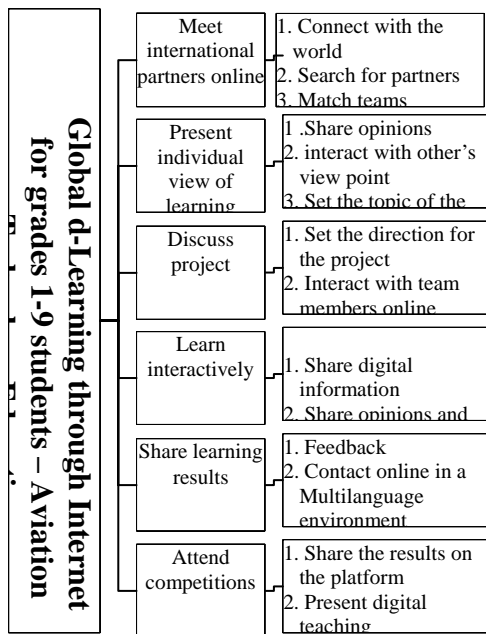


Table 1: The structure of the Aviation Project in portfolio assessment

3 Expected Benefits

This study proposed a culture exchange structure. It's aimed at building a high-quality online learning environment, integrating learning resources, improving online learning environment, and stimulate teachers' motivation of learning.

This network exchanges the structure and beneficial result to have mainly:

- 1 Meet international partners online:
- 2 Present individual view of learning:
- 3 Discuss project:
- 4 Learn interactively:
- 5 Share learning results
- 6 Attend competitions

It is hoped to promote e-learning at domestic schools and to achieve the perspective of 'Creative Taiwan, connecting globally.'

4 Conclusion

Finally, we have been collaborating with d-Learning partner to help students develop e-portfolios while in Primary and Middle School. We have learned how to transfer students who initiate e-portfolios before they join Collaborative Online Network and Aviation Technology Education Project in Taiwan.

Use the transnational digit to study the record, to study the mechanism and digit course file of the platform, and complement it with beauty, resources of the teaching material of country, NASA science and technology of aviation, lead the students of middle and primary schools from various countries of this special project to build and construct out the concept of science and technology of aviation, which accords with culture background, world trends, let student teaching material, teaching method, relevant resource, concept exchange and among the course that share via transnational science and technology of aviation in the course of studying, pregnant with can select suitable materials and continue, treasure resources to show loving care for the aggressive new generation aviation skilled personnel of the earth, innovation forever.

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